

# FOCUSING AND NEUTRALIZATION OF INTENSE ION BEAMS WITH A METALLIC FUNNEL

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The phenomenon of grazing incidence reflection of MeV ion beams from a metallic surface and the production of secondary electrons from this interaction is the basis for a proposal to provide additional focusing and neutralization using a metallic funnel for the ion beams of the Neutralized Drift Compression Experiments (NDCX1 and NDCX2) at LBNL; these beams will be used to heat targets to high temperatures for the study of matter under warm dense matter (WDM) conditions. The present design of the final focus system provides a high-field solenoid and an injected neutralizing plasma to focus the beam onto the target. The addition of a metallic funnel inserted in close proximity to the target will concentrate the ions and provide additional secondary electrons for neutralization in the region of high compression. We will present Particle-in-Cell simulations of the dynamics of the ion beam as it propagates through the funnel and onto the target for cases where the inner bore of the cone may have a straight or curved profile, and compare with initial experiments to focus ion beams with a gold cone in the NDCX1 accelerator.

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